

Claims

1. A weft knitting machine having movable sinkers, in which a needle bed is formed such that a large number of needle plates are arranged in a direction toward an area for knitting a knitted fabric, on a base stage that is disposed facing the area for knitting a knitted fabric, the needle plates are formed so as to have a small plate thickness at end portions on a side of the area for knitting a knitted fabric, needle grooves whose width becomes large on a side of the area for knitting a knitted fabric are formed between the needle plates, a knitting needle is accommodated in each of the needle grooves, and a movable sinker is accommodated at each of end portions of the needle grooves in which the width becomes large, and in which while letting a carriage travel back and forth on the needle bed along the area for knitting a knitted fabric, the knitting needles are selectively moved forward into and backward from the area for knitting a knitted fabric, so that a knitted fabric is knitted by an interaction with the movable sinkers,

wherein the end portions, on a side of the area for knitting a knitted fabric, of the needle plates have recess portions for supporting the movable sinkers such that the movable sinkers can be swingingly displaced, and

wherein the movable sinkers have support portions that are supported by the recess portions, passive portions that are driven following a back and forth displacement with respect

to the area for knitting a knitted fabric, and operation portions that operate as sinkers with respect to the area for knitting a knitted fabric when a back and forth displacement with respect to the passive portions is converted into a swinging displacement with the support portions serving as supporting points,

the weft knitting machine, comprising:

a sinker jack that is accommodated in each of the needle grooves, can be displaced forward into and backward from the area for knitting a knitted fabric, is engaged with the passive portion of the movable sinker at an end portion, has a butt projecting in a direction away from the base stage of the needle bed on a side of a base portion extending in a direction away from the area for knitting a knitted fabric with respect to the end portion, and has a cutout portion that extends in a direction of the back and forth displacement in a middle between the end portion and the base portion;

a passing-through member that passes through each of the needle plates in a direction along the area for knitting a knitted fabric, and is inserted into the cutout portion of the sinker jack and thus regulates the sinker jack so as to be slidingly displaced without moving away from the needle groove;

a drive mechanism that is provided on the carriage, and is capable of selectively driving the sinker jack, by acting on the butt of the sinker jack, to move backward from the area for knitting a knitted fabric such that the operation portion

of the movable sinker is withdrawn from the area for knitting a knitted fabric; and

an interlock mechanism that is provided in a position away from the area for knitting a knitted fabric, within a range in which the sinker jack is displaced back and forth, in each of the needle grooves, and that interlocks, at a backward position, the sinker jack driven by the drive mechanism so as to move backward.

2. The weft knitting machine of claim 1, wherein the interlock mechanism interlocks a protrusion provided on a side of the base portion of the sinker jack with a member passing through the needle plate in a direction along the area for knitting a knitted fabric.

3. The weft knitting machine of claim 1 or 2, wherein the drive mechanism uses a solenoid as a driving source, includes a cam that can switch between operation/non-operation in accordance with presence/absence of excitation of the solenoid, and moves, by operation of the cam, the butt backward to a position for interlocking with the interlock mechanism.

4. A weft knitting machine having movable sinkers, in which a needle bed is formed such that a large number of needle plates are arranged in a direction toward an area for knitting a knitted

fabric, on a base stage that is disposed facing the area for knitting a knitted fabric, the needle plates are formed so as to have a small plate thickness at end portions on a side of the area for knitting a knitted fabric, needle grooves whose width becomes large on a side of the area for knitting a knitted fabric are formed between the needle plates, a knitting needle is accommodated in each of the needle grooves, and a movable sinker is accommodated at each of end portions of the needle grooves in which the width becomes large, and in which while letting a carriage travel back and forth on the needle bed along the area for knitting a knitted fabric, the knitting needles are selectively moved forward into and backward from the area for knitting a knitted fabric, so that a knitted fabric is knitted by an interaction with the movable sinkers,

wherein the end portions, on a side of the area for knitting a knitted fabric, of the needle plates have recess portions for supporting the movable sinkers such that the movable sinkers can be swingingly displaced,

wherein the movable sinkers have support portions that are supported by the recess portions, passive portions that are driven following a back and forth displacement with respect to the area for knitting a knitted fabric, and operation portions that operate as sinkers with respect to the area for knitting a knitted fabric when a back and forth displacement with respect to the passive portions is converted into a swinging displacement

with the support portions serving as supporting points,

wherein the knitting needle is disposed with the movable sinker side by side in a width direction in each of the needle grooves, and is a compound needle in which a needle main portion and a slider can be independently displaced forward into and backward from the area for knitting a knitted fabric, and

wherein each of the needle grooves includes:

a sinker jack that can be displaced forward into and backward from the area for knitting a knitted fabric, is engaged with the passive portion of the movable sinker at an end portion, has a butt projecting in a direction away from the base stage of the needle bed on a side of a base portion extending in a direction away from the area for knitting a knitted fabric with respect to the end portion, and has a cutout portion that extends in a direction of the back and forth displacement in a middle between the end portion and the base portion,

a spacer that is disposed in a direction away from the base stage of the needle bed with respect to the knitting needle, whose bottom portion regulates the knitting needle so as not to move away from the base stage, whose side portion regulates the sinker jack so as not to be shifted in a width direction of the needle groove, and whose side portion has a groove that extends in a direction of the back and forth movement, and

a yarn guide that has a base portion that is fitted into the groove of the spacer such that the base portion can slide

in the direction of the back and forth movement, and a yarn pressing portion that is formed on a side of the area for knitting a knitted fabric with respect to the base portion and that can press a knitting yarn by moving forward into the area for knitting a knitted fabric,

the weft knitting machine, further comprising:

a passing-through member that passes through the spacer and the needle plate in each of the needle grooves in a direction along the area for knitting a knitted fabric and thus fixes the spacer and the needle plate on each other, and that is inserted into the cutout portion of the sinker jack and thus regulates the sinker jack so as to be slidably displaced without moving away from the needle groove.

5. The weft knitting machine of claim 4, wherein:

the base portion of the yarn guide that is fitted into the groove of the spacer and is slidably displaced is provided with a protrusion, and

the groove of the spacer is provided with a recess for regulating a range in which the protrusion of the yarn guide is displaced.

6. The weft knitting machine of claims 4 or 5, wherein the spacer is provided with an air path that is open on a side of a surface of the needle bed and that is in communication with

a side of the area for knitting a knitted fabric of the knitting needle.

7. A weft knitting machine having movable sinkers, in which in which a needle bed is formed such that a large number of needle plates are arranged in a direction toward an area for knitting a knitted fabric, on a base stage that is disposed facing the area for knitting a knitted fabric, the needle plates are formed so as to have a small plate thickness at end portions on a side of the area for knitting a knitted fabric, needle grooves whose width becomes large on a side of the area for knitting a knitted fabric are formed between the needle plates, and a knitting needle is accommodated in each of the needle grooves, and a movable sinker is accommodated at each of end portions of the needle grooves in which the width becomes large, and in which while letting a carriage travel back and forth on the needle bed along the area for knitting a knitted fabric, the knitting needles are selectively moved forward into and backward from the area for knitting a knitted fabric, so that a knitted fabric is knitted by an interaction with the movable sinkers,

wherein the end portions, on a side of the area for knitting a knitted fabric, of the needles plates have recess portions for supporting the movable sinkers such that the movable sinkers can be swingingly displaced, and

wherein the movable sinkers have support portions that are supported by the recess portions, passive portions that are driven following a back and forth displacement with respect to the area for knitting a knitted fabric, and operation portions that operate as sinkers with respect to the area for knitting a knitted fabric when a back and forth displacement with respect to the passive portions is converted into a swinging displacement with the support portions serving as supporting points,

the weft knitting machine, comprising:

a sinker jack that is accommodated in each of the needle grooves, can be displaced forward into and backward from the area for knitting a knitted fabric, is engaged with the passive portion of the movable sinker at an end portion, has a butt projecting in a direction away from the base stage of the needle bed on a side of a base portion extending in a direction away from the area for knitting a knitted fabric with respect to the end portion, and has a groove that extends in a direction of the back and forth displacement in a middle between the end portion and the base portion,

a passing-through member that passes through each of the needle plates in a direction along the area for knitting a knitted fabric, and is inserted into the cutout portion of the sinker jack and thus regulates the sinker jack so as to be slidably displaced without moving away from the needle groove, and

a spring for applying a force to the movable sinker such

that the operation portion moves forward into the area for knitting a knitted fabric,

wherein the passive portion of the movable sinker and the end portion of the sinker jack are engaged with each other by a force applied by the spring such that the passive portion and the end portion abut against each other on one side and a gap is provided for clearance on the other side.

8. The weft knitting machine of claim 7, wherein:

the operation portion of the movable sinker is provided with a catch for pressing a knitting loop that has been knitted, and

the gap at a portion in which the passive portion of the movable sinker and the end portion of the sinker jack are engaged with each other is formed, within a range from a state in which the passive portion and the end portion abut against each other on one side of the gap to a state in which the passive portion and the end portion abut against each other on the other side of the gap, such that a position of the catch of the movable sinker is regulated to be on a side that is different from a position of a yarn feeding port for feeding a knitting yarn to a hook, with respect to a position through which the hook of the knitting needle passes when the knitting needle is displaced forward into and backward from the area for knitting a knitted fabric.

9. The weft knitting machine of claim 7 or 8, wherein:
the passive portion of the movable sinker has a protrusion
that projects toward a side of the end portion of the sinker
jack,

the end portion of the sinker jack has a recess that is
wider than a width of the protrusion, and

the engagement is made with the recess and the protrusion.

10. The weft knitting machine of claim 7 or 8, wherein:
the end portion of the sinker jack has a protrusion that
projects toward a side of the passive portion of the movable
sinker,

the passive portion of the movable sinker has a recess
that is wider than a width of the protrusion, and

the engagement is made with the recess and the protrusion.